SHOW OFF!

Articles and activities to get you ready for your upcoming science fair.

WINNER! DISCOVERY CHANNEL YOUNG SCIENTIST CHALLENGE

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Age 14, Scripps Ranch High School, San Diego, CA

When it comes to science fair competitions, sometimes the simplest ideas take the cake. Take Shannon McClintock, for instance. Her grand-prize-winning project, entitled The Little Engine That Could: Enhancing Traction Through Friction, was far from flashy. It wasn't rocket science, as they say. But it was a stellar example of the Scientific Method at its best.

Brainstorming a science fair topic can be nerve-wracking; it's easy to get worked up and make it more complicated than it has to be. Simple observation of the world around you often reaps the most effective results. Sometimes the answer is in your own backyard.

The 14-year-old San Diego resident came up with her topic one day while chatting with her grandfather about his old car. He was explaining how he used sand to help the tires gain traction in the driveway. This got Shannon thinking. She wondered if this was the best solution, or if some other materials might be more effective. She guessed the latter.

It may not sound cutting edge, but all of this hard work paid off, landing Shannon a spot in the 2004 Discovery Channel Young Scientist Challenge. Shannon participated in 2 days of "Extreme Einstein Challenges" that took place at the University of Maryland's Cole Field House.

THIS COULD BE YOU!

To win a nomination to the Discovery Channel Young Scientist Challenge, all you need to do is present a project at your local or regional International Science and Engineering (ISEF)-affiliated science fair. All entrants must be in grades 5 through 8 when they enter their local fairs. For more info, see: www.discovery.com/dcysc.

BIG IDEAS & SMALL MIRACLES

CLOCKY: THE ALARM CLOCK FOR PEOPLE WHO HAVE TROUBLE WAKING UP

When the alarm clock goes off and the snooze button is pressed, Clocky will fall off of the bedside table and wheel away, bumping mindlessly into objects on the floor until he eventually finds a place to rest. Minutes later, when the alarm sounds again, you must get out of bed and search for Clocky. Because you employ multiple senses to find the clock, you are sure to wake up before disabling the alarm. Small wheels enable Clocky to move and reposition himself, and an internal computer helps him find a new hiding spot every day.
Clocky is an academic research project and is not commercially available at this time.
For more info, see: www.media.mit.edu/press/clocky

WATER-SOLUBLE GOLF BALLS: THEY DISSOLVE INTO FISH FOOD

Newfangled Eco Golf Balls dissolve into fish food within hours of hitting the water. The U. S. Navy first used them as part of the Golf at Sea Program during Operation Enduring Freedom. The company also makes biodegradable Eco Golf Tees from corn. For more info, see: www.ecogolf.com

TOTALLY ABSURD INVENTIONS

A Web site devoted to "totally absurd" inventions, such as the diaper alarm, motorized ice-cream cone, ski fan, lip clip, and zero-gravity squeeze box.
For more info, see: www.totallyabsurd.com

TOTALLY ECCENTRIC INVENTOR

Beginning in the 1960s, British inventor Arthur Paul Pedrick patented a total of 161 inventions, but never sold any of them. High points included a horse-powered car, a revolving restaurant-television tower, and a device to fling giant snowballs from Antarctica to irrigate the world's deserts.
For more info, see: www.inventors.about.com

COOL INVENTIONS BY KIDS

Learn about ingenious devices like the Cast Cooler, invented by disabled teenager Krysta Morlan to alleviate the discomfort of wearing a cast in the summer heat. The Cast Cooler pipes cool air into the cast through a plastic tube, using a contraption built out of an aquarium pump, a nine-volt battery and a small electric motor. Krysta later invented the semi-submersible, fin-propelled Water Bike.
For more info, see: www.inventors.about.com/od/kidinventions

WHERE DO IDEAS COME FROM?

1. BE AWARE

Wondering where to begin? Simply observe the world around you. Science is everywhere you look—in your kitchen, your garage, the skatepark down the street, in a puddle or a tidepool, on an anthill or a ski slope, even in your uncle's autobody shop. Think like a scientist.

2. BE CURIOUS

The best topics are sparked by curiosity. The more compelling you find your topic, the more engaged you'll be for the full six weeks. Plan to devote a good deal of time to brainstorming your topic. Visit your town or school library and flip through a stack of science magazines. Read about the latest trends and discoveries in the Science and Technology sections of your newspaper.

3. BE REASONABLE

When it comes to brainstorming your topic, start big, then narrow it down. Remember, your topic must be narrow enough to be testable and measurable. It must also be manageable and capable of being mastered in a short period of time. Soon you'll be expected to be an expert on your chosen topic and be able to answer questions from peers, teachers and perhaps judges. So keep it simple!

4. BE FOCUSED

Come up with a list of questions. Things you've always wondered about; things you're suddenly curious about. Then do some preliminary research to refine your questions. Next you'll parlay the best one into a working hypothesis.

HERE'S AN EXAMPLE:

Subject Area: Food and Nutrition

Topic: Vitamin C

Questions:

- Do oranges lose any Vitamin C after they're picked off the tree?
- Do whole oranges contain more Vitamin C than orange juice?
- Do different brands of orange juice contain different amounts of Vitamin C?
- Which fruits contain the highest concentrations of Vitamin C?
- Does light or temperature affect the Vitamin C content of juice?

ROLL WITH YOUR LOGBOOK

The first thing you should do, even before you begin brainstorming, is to get a notebook to serve as your dedicated science project "logbook." Every professional scientist keeps a notebook with him/her at all times, and you'll be expected to do the same.

MAKE YOUR INTERESTS PAY OFF

FOLLOW YOUR INTERESTS

Let your hobbies be your guide. Learn about the scientific principles behind your favorite activities, and then come up with some questions. Fiddle around with your ideas, figure out the best question and then formulate that into a hypothesis.

INTERESTED IN FASHION?

Experiment with various natural ingredients to dye fabrics such as beets, berries, red cabbage, wildflowers, onion skins, nut shells, tea, and tumeric powder. Compare the breathability and heat retention of different fabrics.

SPORTS?

Explore the physics behind skateboard tricks or snowboarding. Why do some balls bounce higher than others? Which makes a ball go faster—a metal bat or a wooden bat?

MUSIC?

Build your own radio and uncover a scientific problem along the way. Study the scientific principles behind your favorite musical instrument. Compare the quality of analog (record) vs. digital (CD) sound recordings. Does room temperature affect the sound or pitch of musical instruments?

ART?

Make a spin-painting machine to demonstrate centrifugal force. How is paint affected by temperature changes? How do museum conservators preserve paintings and textiles?

DIGITAL PHOTOGRAPHY?

Compare different digital image formats. How does the amount of compression affect a JPEG image? Examine DPI and image quality.

THE LONG AND THE SHORT OF IT

YOUR PROJECT'S SIX-WEEK SCHEDULE

Instead of one long, involved process, think of your science fair project as a series of shorter steps. That way, you won't feel overwhelmed at the beginning, and you'll be able to think through each step and keep track of your progress. You can do it!

Date of the science fair: _____

Date to begin working on project : _____
(Six weeks before science fair opening date)

Scheduled Weekly Events

	Scheduled Completion	Actual Completion

WEEK 1: START UP!

- Choose a topic or problem to investigate.
- Start a journal to keep all your notes and research along the way.
- Begin primary research: Write for information from experts, such as scientists, businesses and government agencies. Set up interviews when necessary.
- Begin secondary research: Search printed sources (books, journals, magazines, and newspapers) and electronic sources (Internet and software).

WEEK 2: RESEARCH & REVISE

- Change your topic or problem if necessary.
- Decide how to set up your investigation or experiment, including the procedure and necessary materials.
- From your initial research, write your hypothesis.
- Continue your research using the best resources you found.
- Interview experts for more information.

WEEK 3: OUTLINE & INVESTIGATE

- Complete initial research. Set up outline for written report.
- Start your experiment or demonstration collection.
- Record observations in your journal.
- Begin collecting or buying materials for your display.

WEEK 4: RECORD & REPORT

- Work on first draft of written report.
- Continue to record observations from your experiment in your journal.
- Write down or sketch preliminary designs for your display.

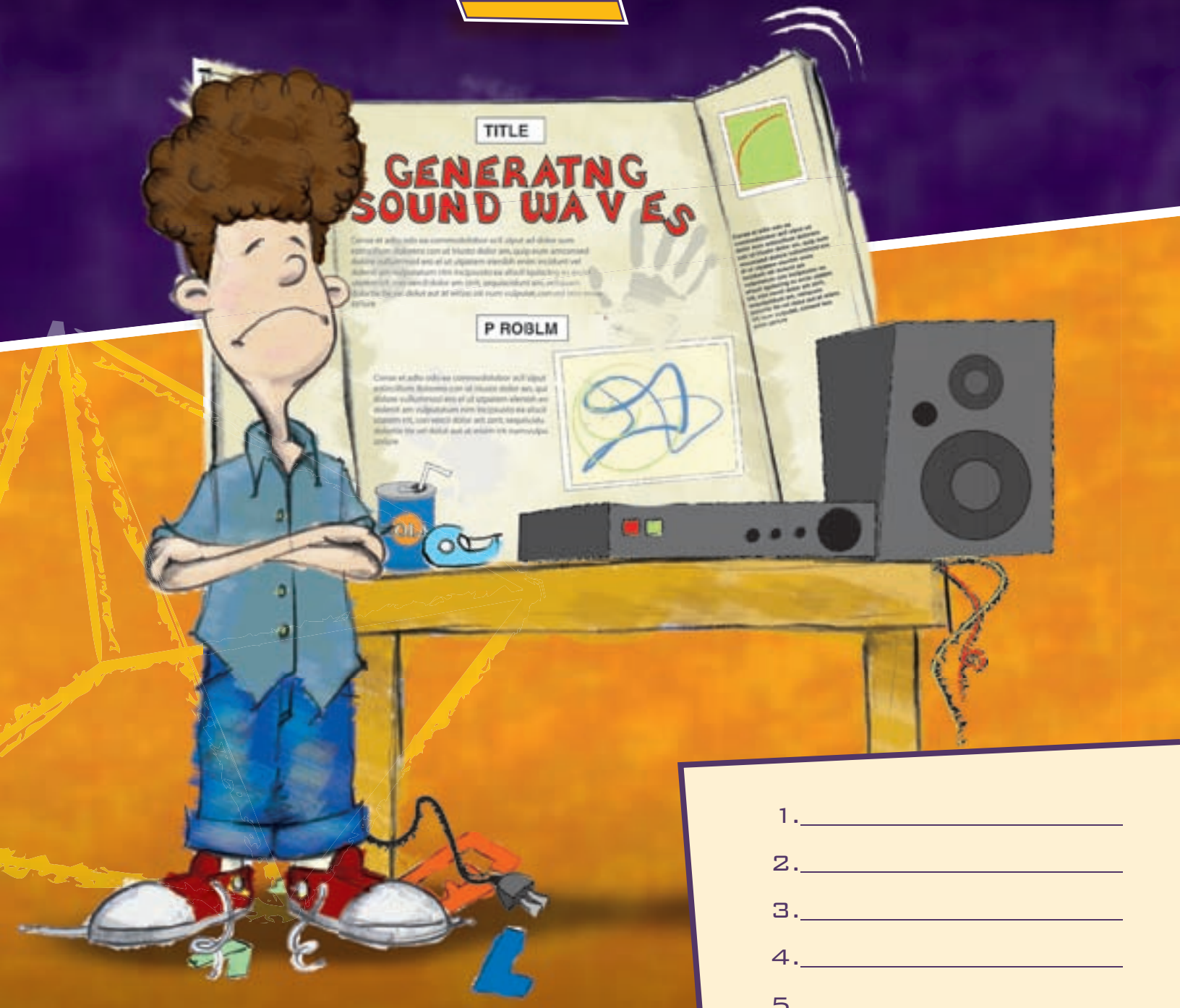
WEEK 5: DESIGN & REFINE

- Write second draft of your report.
- Start assembling display unit.
- Begin designing signs, labels, charts, graphs, or other visual aids for display.
- Write text for background of display and plan its layout.
- Continue to record observations from experiment.
- Take any photographs you need.

WEEK 6: FINISH UP!

- Complete your experiment or collection.
- Analyze observations and write up your results.
- Write, type, and proofread final version of written report.
- Have photographs developed and enlarged.
- Type explanations or background information and mount them to your display.
- Finish constructing your display, including graphs, charts and visual aids.

WHAT NOT TO DO...



Don't be like this student. Take the time to give your project the display it deserves! Properly displaying your project and being able to communicate effectively about it are two keys to success.

FIND AND CIRCLE 10 PRESENTATION MISTAKES IN THIS PICTURE. IN THE SPACES PROVIDED, SUGGEST HOW THIS STUDENT MIGHT HAVE DONE BETTER.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

ELMER'S

Discovery EDUCATION

Answers: Make lettering neat and even • Straighten display board and properly attach all materials • Do not leave unexposed wires • Use proper headers • Clean up display area • Check spelling
Use simple, easy-to-understand photos and graphics • Remove fingerprints and smudges from the board • Include project report • Make sure all props are stable